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Vigorous Physical Activity Modestly More Protective than Moderate Activity

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March 5, 2010 (San Francisco, California) — Vigorous physical activity is associated with a modestly lower risk of cardiovascular disease when compared with activities of moderate intensity, a new study shows [1]. The researchers found that the total volume of activity may be associated with the greatest reduction in risk, however, and that increased physical activity, even vigorous activity, did not appear to have any detrimental effects.

"If two people are expending a thousand calories per week, does it matter if they do that by running or by walking?" said lead investigator **Dr Andrea Chomistek** (Harvard Medical School, Boston, MA) in explaining the rationale of the study to **heartwire**. "We found that there might be some benefit to doing it with vigorous activity such as running, but it doesn't appear to be a very strong benefit. As long as you're burning a certain amount of calories per week, between 600 or 1000 calories per week, it's okay if you do that by walking. You don't necessarily have to go out and run a marathon."

Presenting the results of the study here this week at **EPI|PNAM 2010**, the **Cardiovascular Disease Epidemiology and Prevention and Nutrition, Physical Activity, and Metabolism 2010 Conference**, Chomistek said that approximately 2.5 hours per week of moderate to vigorous physical activity has been shown to lower the risk of cardiovascular disease, but the dose-response curve is not well defined.

There is limited evidence, for example, to support the beneficial effects of large amounts of vigorous activity, and some researchers have even observed cardiovascular injury, as evidenced by elevated troponin levels, among marathon runners and endurance athletes, she noted.

Health Professionals Follow-Up Study

In this analysis of 43 647 individuals participating in the **Health Professionals Follow-Up Study**, the researchers, with senior investigator **Dr Eric Rimm** (Harvard Medical School), wanted to determine whether vigorous activity, independent of the amount of time spent exercising, was associated with a lower risk of cardiovascular disease compared with moderate exercise, and if it was, whether more was better.

In the study, baseline physical activity levels were first collected in 1986 and assessed every two years thereafter until 2004. To control for the time spent exercising, researchers calculated the average intensity of weekly exercise, and this was based on the time spent exercising and the number of metabolic-equivalent-task (MET)-hours expended per week. The primary end point of the study, total cardiovascular disease, included fatal coronary heart disease, nonfatal MI, and fatal and nonfatal stroke.

Among individuals who exercised the same number of MET-hours per week, vigorous activity was associated with a trend toward lower risk of cardiovascular disease compared with individuals who performed moderate activity. For example, for those who expended six to 15 MET-hours per week, there was a modestly lower risk of cardiovascular disease among those who performed vigorous activity, such as bicycling or running, compared with those walked briskly or lifted weights.

Risk Ratios (95% CI) of Cardiovascular Disease Associated With Exercise Intensity and MET-Hours Per Week

MET-hours/week	Low moderate (average intensity 3–4.4 METs)	High moderate (average intensity 4.5–5.9 METs)	Low vigorous (average intensity 6–7.4 METs)	High vigorous (average intensity >7.5 METs)
<6	1.00	0.86 (0.71–1.04)	0.84 (0.63–1.11)	1.16 (0.57–2.35)
6–15	0.98 (0.86–1.11)	1.04 (0.89–1.21)	0.87 (0.70–1.08)	0.65 (0.38–1.11)
>15	0.84 (0.74–0.94)	0.83 (0.73–0.93)	0.82 (0.71–0.95)	0.75 (0.63–0.90)

The researchers point out that the total volume of physical activity at all intensity levels appeared to be associated with the largest reduction in risk, and that there doesn't appear to be any harm in the amount of exercise done weekly.

"There has been some concern among individuals, such as those who run triathlons and marathons, that doing long amounts of endurance activity could actually damage the heart," said Chomistek. "We've seen elevations in troponin levels in these athletes, so we wanted to see whether there was a point at which maybe too much running isn't good. We found that wasn't really true. You can really do as much as you want. It's still effective."

The researchers did report that the lowest risk of cardiovascular disease was observed in men performing 6 to 7.9 hours of vigorous activity per week, and the risk of cardiovascular disease was slightly higher, but not statistically so, in those who performed more exercise.

Nadir of Cardiovascular Risk

Commenting on the results of the study for **heartwire**, **Dr William Krauss** (Duke University Medical Center, Durham, NC), who was not involved in the analysis, noted the **Harvard Alumni Health Study**, led by the late **Dr Ralph Paffenbarger** (Stanford University School of Medicine, CA), suggested there might be a nadir of cardiovascular risk among runners who ran 20 miles per week, but an increased risk among those who ran 50 to 60 miles per week. Krauss noted that this increased risk was not statistically significant, and other studies have not shown an inverse risk with more time spent exercising.

"This is still an open question," said Krauss. "Six hours of vigorous activity per week is lot. When you're starting to get to eight or 10 hours per week, that's training for marathons and other endurance events. I wouldn't suspect there would be an adverse cardiovascular effect, but more adverse noncardiac effects, such as injuries, that would lead to long-term inactivity. But this study is reassuring in that there is no adverse effect on the cardiovascular system."

Asked about the current guidelines, Chomistek told **heartwire** that the focus remains on getting individuals active.

"There are still so many people in the population who don't do anything," she said. "If we tell these patients that they have to go out and run a marathon, they're probably not going to do it. We can still have the guidelines for those people, but for people who are already active, we can tell them to keep increasing their activity, because you're going to get greater benefit. So even if you're doing the two-and-a-half hours a week that you're supposed to do, there is still greater benefit if you do more than that."

References

1. Chomistek AK, Rimm EB. Physical activity and incident cardiovascular disease: investigation of the effect of high amounts of vigorous-intensity activity. EPI|PNAM 2010; March 3, 2010; San Francisco, CA. Abstract 2.

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American Heart Association Joint 50th Cardiovascular Disease Epidemiology and Prevention and Nutrition, Physical Activity and Metabolism Conference 2010 (AHA EPI-NPAM 2010)